

[0089] In addition, FIG. 5 depicts steps performed in a particular order for purposes of illustration and discussion. Those of ordinary skill in the art, using the disclosures provided herein, will understand that the steps of any of the methods disclosed herein can be modified, adapted, rearranged, omitted, and/or expanded in various ways without deviating from the scope of the present disclosure.

[0090] At 502, the system controller 200 accesses data indicative of a grid service request. At 504, the system controller obtains state of asset data, market input data, operator input data, system constraint data, and/or environmental data.

[0091] At 506, the system controller 200 identifies a plurality of candidate responses to the grid service request. At 508, the system controller 200 determines, for each of the plurality of candidate responses, an asset life impact value that describes an impact to an asset life of at least one asset due to such candidate response.

[0092] At 510, the system controller 200 determines a potential revenue value provided by each of the candidate responses. At 512, the system controller 200 determines a total cost value incurred by each of the candidate responses. The total cost value for each candidate response is based at least in part on the asset life impact value determined for such candidate response.

[0093] At 514, the system controller 200 determines a plurality of response scores respectively for the plurality of candidate responses. At 516, the system controller 200 selects one of the candidate responses as a desired response based at least in part on the response scores. At 518, the system controller 200 controls the energy generation and storage system 100 according to the desired response.

[0094] Although specific features of various embodiments may be shown in some drawings and not in others, this is for convenience only. In accordance with the principles of the present disclosure, any feature of a drawing may be referenced and/or claimed in combination with any feature of any other drawing.

[0095] This written description uses examples to disclose the invention, including the best mode, and also to enable any person skilled in the art to practice the invention, including making and using any devices or systems and performing any incorporated methods. The patentable scope of the invention is defined by the claims, and may include other examples that occur to those skilled in the art. Such other examples are intended to be within the scope of the claims if they include structural elements that do not differ from the literal language of the claims, or if they include equivalent structural elements with insubstantial differences from the literal languages of the claims.

What is claimed is:

1. A method for controlling an energy generation and storage system, the method comprising:

accessing, by one or more control devices, data indicative of a grid service request;

determining, by the one or more control devices, a plurality of response scores respectively for a plurality of candidate responses to the grid service request, each candidate response including one or more operational parameters of the energy generation and storage system, the one or more operational parameters including at least a split value that describes a power split between one or more energy generation assets and one or more energy storage assets of the energy generation

and storage system, and wherein the response score determined for each candidate response is based at least in part on an asset life impact value that describes an impact that such candidate response would have on an asset life of at least one of the one or more power generation assets and the one or more energy storage assets of the energy generation and storage system;

selecting, by the one or more control devices, one of the candidate responses as a desired response to the grid service request based at least in part on the plurality of response scores; and

controlling, by the one or more control devices, the energy generation and storage system according to at least the split value of the desired response.

2. The method of claim 1, wherein determining, by the one or more control devices, a plurality of response scores respectively for a plurality of candidate responses comprises iteratively adjusting, by the one or more control devices, the one or more operational parameters until a candidate response with a desired response score is achieved.

3. The method of claim 1, wherein determining, by the one or more control devices, the plurality of response scores respectively for a plurality of candidate responses comprises, for each of a plurality of scoring iterations until a desired response score is achieved:

adjusting, by the one or more control devices, at least one of the one or more operational parameters of an input candidate response; and

inputting, by the one or more control devices, the adjusted operational parameters of the input candidate response into a scoring model to obtain one of the plurality of response scores;

wherein the iterative adjustments to the one or more operational parameters of the input candidate response respectively define the plurality of candidate responses.

4. The method of claim 3, wherein adjusting, by the one or more control devices, the at least one of the one or more operational parameters of the input candidate response comprises adjusting, by the one or more control devices, the split value of the input candidate response.

5. The method of claim 3, wherein adjusting, by the one or more control devices, the at least one of the one or more operational parameters of the input candidate response comprises adjusting, by the one or more control devices, a total power setpoint of the energy generation and storage system, the total power setpoint less than or equal to a requested amount of power specified by the grid service request.

6. The method of claim 3, wherein the scoring model includes an asset life scoring component that outputs the asset life impact value based at least in part on the split value.

7. The method of claim 6, wherein the asset life scoring component outputs the asset life impact value based at least in part on one or more of a projected temperature rise across one or more energy storage cells, a state of charge of the one or more energy storage cells, and an ambient temperature at the one or more energy storage cells.

8. The method of claim 6, wherein the asset life scoring component comprises one or more asset life maps for one or more of the energy generation assets and energy storage assets, wherein the asset life map for each asset outputs the asset life impact value as a function of an asset power output setpoint.